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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/577,043	06/25/2007	Kenji Shinozaki	2342-0147PUS1	2316
2292 7590 04/16/2009 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				
EXAMINER WOLVERTON, DAREN A				
ART UNIT 2813		PAPER NUMBER		
NOTIFICATION DATE 04/16/2009		DELIVERY MODE ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary

Application No.

10/577,043

Applicant(s)

SHINOZAKI, KENJI

Examiner

DAREN WOLVERTON

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 April 2006.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-10 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 24 April 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-624)
Paper No(s)/Mail Date 07/18/2006, 04/24/2006
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Priority

Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on 03/01/2004. It is noted, however, that applicant has not filed a certified copy of the 2004-056363 application as required by 35 U.S.C. 119(b).

Information Disclosure Statement

The information disclosure statement filed 04/24/2006 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered. Note that the USPTO does not automatically receive the references cited by other international searching authorities.

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 142 and 136. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 10, 30, 26, and 21. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "105" has been used to designate both an IO Stage (in FIG. 6) and an unknown part (in FIG. 1) and reference character "101" has been used to designate both a case (in FIG. 6) and an unknown part (in FIG. 1). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application.

Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 4-6 and 8-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 4-6, claim 4 recites “a temperature of the first casing is lower than a temperature of the second casing”, however dependent claims 5 and 6 claim that the temperature of the first casing is higher than that of the second casing. This contradiction renders the claims indefinite. Based on the specification it seems that claim 4 should recite “that a temperature of the first casing is **higher** than a temperature of the second casing”. This will be used for the purposes of this action.

Regarding claims 8 and 9, claim 8 recites “that the flow rate of the cooling medium is greater in a process in which a temperature of the substrate located in the processing chamber is increased than in a process in which the temperature of the substrate is lowered” however dependent claim 9 recites “that an amount of the cooling medium flowing into the second space in the process in which the temperature of the substrate is increased is the same as in the process in which the temperature of the

substrate is lowered, and an amount of the cooling medium flowing into the first space in the process in which the temperature of the substrate is lowered is greater than in the process in which the temperature of the substrate is increased.” This contradiction renders the claim indefinite. Based on the specification (specifically paragraph [0035]) it seems that the flow rate should be greater when the substrates temperature is being decreased than when it is being increased. This will be used for the purposes of this action.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 7, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ferro et al. (US PG PUB 2003/0073293) (*Ferro*, hereinafter) in view of Tay et al. (US PG PUB 2003/0094446) (*Tay*, hereinafter) and Schooley et al. (US 4,101,424) (*Schooley*, hereinafter).

Regarding claims 1 and 10, *Ferro*, in FIG.1, discloses a substrate processing apparatus 10 (a CVD reactor, which is used to deposit a desired film on a substrate), comprising: a processing chamber 12 which provides a space for flowing desired gas (paragraph [0035]) and for depositing a desired film on a substrate 16 (specifically a wafer); a lamp unit group 13 having at least one lamp unit which is disposed in the

processing chamber 12 and which includes a filament for heating the substrate 16 and a lamp tube surrounding the filament (paragraph [0027] and paragraph [0028]);

Ferro differs from the claimed invention in that it does not disclose first casings surrounding the lamp units.

Tay, in FIG. 3, discloses a rapid thermal processing system in which first casings 74 (optically transparent enclosures such as quartz tubes) through which cooling medium flows (paragraph [0057]) surround the lamp units 70. Note that the cooling medium is air (paragraph [0089]).

Therefore, in view of *Tay*, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of *Ferro* by adding first casings, through which air as a cooling medium will flow, to the lamp units.

One of ordinary skill in the art would be motivated to do this in order to keep the lamp units from overheating and shorting their lifespan.

The above modified invention of *Ferro* differs from the claimed invention in that it does not disclose second casings which surround the lamp units and the first casings.

Schooley is a related art invention which discloses an improvement to a UV lamp. *Schooley*, in FIG. 1, discloses a second casing 31 (a quartz tube) through which cooling medium flows (column 3, lines 43-45) surrounding a first casing 30 (another quartz tube) and a lamp 20. Note that the second casing has a reflector 48 for focusing the light emitted from the surface and the cooling medium is water.

Therefore, in view of *Schooley*, it would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the invention of *Ferro* by

adding a second casing (with the reflector) surrounding the first casing (from the invention of *Tay*), with water as a cooling medium flowing between the first casing and the second casing.

This would have been obvious because the technique for improving a particular class of devices (IR lamps) was part of the ordinary capabilities of a person of ordinary skill in the art, in view of the teaching of the technique for improvement in other situations (UV lamps). Additionally, one of ordinary skill in the art at the time of the invention would be motivated to add the second casing in order to improve the temperature control of the lamp while adding a reflector to focus the radiation that will stay cool (and thus not have unwanted deposition or significantly delay the cooling of the substrate).

The above modified invention of Ferro differs from the claimed invention in that it does not explicitly disclose a refrigerant flowing apparatus for flowing the cooling medium in the first space formed between the lamp unit and the first casing and the a second space formed between the first casing and the second casing.

However, as the combined invention has cooling mediums flowing between the lamp and the first casing and the first casing and the second casing it is inherent that such apparatus exists. Note, that the term 'refrigerant' is being read broadly as any fluid capable of reducing the temperature of some object.

Regarding claim 7, note that in the above combination, different cooling mediums are respectively flowed into the first space (air) and the second space (water) at least while the substrate is being processed in the processing chamber, and a cooling

efficiency of the cooling medium flowing into the second space (water) is higher than a cooling efficiency of the cooling medium flowing into the first space (air).

Claims 2-6 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Ferro*, *Tay*, and *Schooley* as applied to claim 1 above, and further in view of *Shamouilian et al.* (US PGPUB 2001/0042594) (*Shamouilian*, hereinafter).

Regarding claims 2-6 and 8-9, The combined invention of *Ferro*, *Tay*, and *Schooley* discloses all of the limitations of claim 1 but does not disclose the use of a controller.

The related art invention of *Shamouilian* discloses, in paragraphs [0037] and paragraph [0041] through paragraph [0043] discloses a computer based control system that controls both the temperature and the flow rate of a cooling fluid.

Therefore, in view of *Shamouilian*, it would have been obvious to one of ordinary skill in the art at the time of the invention to improve the combined invention of *Ferro*, *Tay*, and *Schooley* by adding a computer control system to control the flow rates and the temperatures of the first and second processing fluids (and thereby control the temperature of the first and second casings).

One of ordinary skill in the art at the time of the invention would be motivated to do this in order to gain the well known advantages of computer operation.

The limitations on what exactly the controller does during processing are merely functional/intended use limitations that do not structurally distinguish the claimed invention over the prior art. While features of an apparatus may be recited either

structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997).

Regarding claim 2, in the above disclosed combination the controller would be capable of controlling "the refrigerant flowing apparatus such that an amount of cooling medium allowed to flow into the second space is greater than an amount of cooling medium allowed to flow into the first space at least while the substrate is being processed in the processing chamber".

Regarding claim 3, in the above disclosed combination the controller would be capable of controlling "the refrigerant flowing apparatus such that the cooling medium is flowed into the second space at a constant flow rate and the cooling medium is flowed into the first space while varying a flow rate".

Regarding claim 4, in the above disclosed combination the controller would be capable of controlling "amounts of cooling medium flowing into the first and second spaces such that a temperature of the first casing is **higher** than a temperature of the second casing at least while the substrate is being processed in the processing chamber". Please see the 112 rejection section above.

Regarding claim 5, in the above disclosed combination the controller would be capable of controlling the temperature of the first casing to be in a range of 300 to 500°C.

Regarding claim 6, in the above disclosed combination the controller would be capable of controlling the temperature of the second casing to be equal to or less than 200°C.

Regarding claim 8, in the above disclosed combination the controller would be capable of controlling "the refrigerant flowing apparatus such that the flow rate of the cooling medium is greater in a process in which a temperature of the substrate located in the processing chamber is **decreased** than in a process in which the temperature of the substrate is **raised**". Please see the 112 rejection section above.

Regarding claim 9, in the above disclosed combination the controller would be capable of controlling the refrigerant flowing apparatus "such that an amount of the cooling medium flowing into the second space in the process in which the temperature of the substrate is increased is the same as in the process in which the temperature of the substrate is lowered, and an amount of the cooling medium flowing into the first space in the process in which the temperature of the substrate is lowered is greater than in the process in which the temperature of the substrate is increased".

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAREN WOLVERTON whose telephone number is (571) 270-5784. The examiner can normally be reached on Monday to Thursday from 9:30 a.m. to 3:00 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Landau can be reached on (571) 272-1731. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. W./
Examiner, Art Unit 2813

/Matthew C. Landau/
Supervisory Patent Examiner, Art
Unit 2813

DW